

THE BELL SYSTEM

Technical Journal

DEVOTED TO THE SCIENTIFIC AND ENGINEERING
ASPECTS OF ELECTRICAL COMMUNICATION

ADVISORY BOARD

A. B. GOETZE

M. J. KELLY

E. J. McNEELY

EDITORIAL COMMITTEE

B. McMILLAN, *Chairman*

K. E. GOULD

S. E. BRILLHART

E. I. GREEN

A. J. BUSCH

R. K. HONAMAN

L. R. COOK

H. R. HUNTLEY

A. C. DICKIESON

F. R. LACK

R. L. DIETZOLD

J. R. PIERCE

EDITORIAL STAFF

W. D. BULLOCH, *Editor*

R. L. SHEPHERD, *Production Editor*

INDEX

VOLUME XXXVI

1957

AMERICAN TELEPHONE AND TELEGRAPH COMPANY
NEW YORK

LIST OF ISSUES IN VOLUME XXXVI

No. 1 January.....	Pages	1-348
" 2 March.....		349-592
" 3 May.....		593-830
" 4 July.....		831-1046
" 5 September.....		1047-1318
" 6 November.....		1319-1514

Index to Volume XXXVI

A

- AF *See* United States Air Force
- Activation of Electrical Contacts by Organic Vapors* (L. H. Germer, J. L. Smith) 769-812
- Agamemnon* (cable ship) 303
- AIR FORCE *See* United States Air Force
- ALASKAN TELEPHONE CABLE 168
- Alignment *See* Misalignment
- ALLENTOWN PLANT (WESTERN ELECTRIC) 107, 123-25
- ALTERNATOR SET
 - two-motor carrier, L-type 140
- AMERICAN TELEPHONE AND TELEGRAPH COMPANY 3, 14-15
- AMPLITUDE MODULATION
 - data transmission systems 1451-86
- AMSTERDAM, HOLLAND 9
- ANALYSIS
 - combinatorial, error correcting coding 517-35
- Angell, Miss D. T. 1033
- ANGLE(S)
 - measurement
 - vernier resolver 1487-1500
- ANGLO-IRISH CABLE 179
- ANSON, H. W. 1093
- ANTENNA
 - radio transmission
 - beyond the horizon 639-40
 - diagrams 599
 - height 597;
 - transmission loss 593-97
- ARMOR, repeaters, transatlantic telephone cable 58
- ARRAY *See* Memory Arrays
- ATLANTIC CABLE 1-2, 4, 303
- ATLANTIC OCEAN
 - Mid-Atlantic Ridge 1066-68
 - North Atlantic, *see* North Atlantic Ocean
 - physiographic diagram* inside rear cover Sept.

- ATMOSPHERE, dielectric constant 603, 627
- ATTENUATION
 - Newfoundland-Nova Scotia link 221-23
 - nonlinear, FM signal 879-89
 - waveguide coupling 392
- Aulock, Wilhelm von
 - biographical material 591
 - Measurement of Dielectric and Magnetic Properties of Ferromagnetic Materials at Microwave Frequencies* 427-48
- AZORES map 8, 294, 296

B

- BOD TEST *See* Test: biochemical oxygen demand
- BSTJ *See* Bell System Technical Journal
- BACTERIA 1097-1127
- Baldwin, J. A. 1337
- Bampton, J. F.
 - biographical material 338
 - System Design for the Newfoundland-Nova Scotia Link* 217-44
- BANDWIDTH
 - transatlantic telephone cable
 - North Atlantic link 34-35
- BATTERY *See* Storage Battery
- BEAM *See* Electron Beam
- Bechofer, R. E. 576
- BELL SYSTEM TECHNICAL JOURNAL
 - advisory board, *see* inside front covers
 - Bulloch, W. D., editor 710
 - editorial committee, *see* inside front covers
 - editorial staff, *see* inside front covers
- BELL TELEPHONE LABORATORIES 4, 57-58, 163
- Bellows, B. C., Jr.
 - biographical material 1511
 - Experimental Transversal Equalizer for TD-2 Radio Relay System* 1429-50

- Beneš, Vaclav E.
 biographical material 1045
Fluctuations of Telephone Traffic 965-73
Sufficient Set of Statistics for a Telephone Exchange Model 939-64
- BERNE, SWITZERLAND 9
Binary Block Coding (S. P. Lloyd) 517-35
- BINARY DIGIT *See* Bit
- BINOMIAL PROCESSES 537-76
- BIOCHEMICAL OXYGEN DEMAND TEST *See* Test
- Biskeborn, M. C.
 biographical material 338
Cable Design and Manufacture for the Transatlantic Submarine Cable System 189-216, 496
- BIT (BINARY DIGIT)
 AM leased-line transmission 1451-86
 twistor devices 1336
- Bleicher, E. 576
- BLOCK CODING *See* Code
- Bobeck, Andrew H.
 biographical material 1511
New Storage Element Suitable for Large Sized Memory Arrays—the Twistor 1319-40
- Bobis, S. 1449
- BORER(s), marine 194
- BOSTON map 8
- Boyd, Richard C.
 biographical material 588
New Carrier System for Rural Service 349-90
- Boyet, H. 426
- Braga, F. J.
 biographical material 338
Repeater Design for the North Atlantic Link 69-101
- Bridgers, H. E. 1004
- BRITISH POST OFFICE, submarine cables, 3-5, 14-15, 57-58, 245
- Brockbank, R. A.
 biographical material 339
Repeater Design for the Newfoundland-Nova Scotia Link 245-76
- BRUSSELS 9
- Buckley, O. E. 67
- BUILDINGS, radio transmission and 613-14
- Bullington, Kenneth
 biographical material 828
Radio Propagation Fundamentals 593-626
- Bulloch, W. D., B.S.T.J. editor 710
- Burke, P. J. 964
- C
- C.C.I.F. *See* International Consultative Committee on Telephony
- CABLE(s)
 Alaska telephone, *see* Alaskan Telephone Cable
 Anglo-Irish, *see* Anglo-Irish Cable
 Hawaii telephone, *see* Hawaiian Telephone Cable
 short-circuits, Poisson patterns 1005-33
 submarine, *see* Submarine Cable
 transatlantic telegraph (1866), *see* Atlantic Cable
 transatlantic telephone, *see* Transatlantic Telephone Cable
 trunks, *see* Trunk
Cable Design and Manufacture for the Transatlantic Submarine Cable System (M. C. Biskeborn, H. C. Fischer, A. W. Lebert) 189-216, 496
- CABLE LAYING 13
 dynamics 1129-1207
 kinematics 1129-1207
 laying effect 43-44
 methods, early 303
 oceanography 1049
 strains 13-14
 transatlantic telephone cable 293-326
- CABOT STRAIT 3
- CANADIAN COMSTOCK CO., LTD. 244
- CANADIAN OVERSEAS TELECOMMUNICATION CORPORATION 3, 7, 244
- CAPACITANCE
 geometries, pressure coefficients 485-95
 submarine cables 485
- CAPACITOR
 carrier, P1 367-68
 mica, repeater, flexible, North Atlantic link 125-26
 parallel plate
 capacitance, pressure coefficients 485-95

- CARBON
 activating
 contacts, electrical 769-812
- CARRIER(S)
 history 350
 L-type
 alternator set 140
 P1 349-90
 capacitors 367-68
 channels 357-59
 compandors 357
 dialing 361-62
 equipment arrangements 369-76
 filters 365-66
 inductors 366-67
 installation 380-90
 maintenance 375
 miniaturization 370
 networks 369
 parameters 351-65
 power supply 376-80
 printed circuitry 371
 repeaters 362-65, 373-75
 ringing 359-61
 signaling 359
 terminals
 block diagram 354
 mounting 373-75
 testing 375
 transformers 368-69
 transistors 349-90
 transmission plan 351-55
 trunks 350
- CASTING RESINS
 BOD test 1099
 marine conditions 1095-1127
- CATALINA ISLAND 13
- CENTRAL OFFICE, service range 350
- Chaffee, J. G. 1449
- CHANNEL(S)
 carrier, P1 357-59
 human, information rate, reading rates
 and 497-516
 noisy, error correction codes 1341-88
 North Atlantic link 38
- Character of Waveguide Modes in Gyromagnetic Media* (H. Seidel) 409-26
- Circular Electric Wave Transmission in a Dielectric-Coated Waveguide* (H.-G. Unger) 1253-78
- Circular Electric Wave Transmission through Serpentine Bends* (H.-G. Unger) 1279-92
- CIRCULAR WAVEGUIDE *See* Waveguide
- CIRCUIT *See* subhead circuit under names of specific equipment and apparatus, e.g. Repeater: flexible: North Atlantic link: circuit; *Also see* Printed Circuitry; Short Circuit
- CLAPP, WILLIAM F., LABORATORIES 1115-21
- CLARENVILLE, NEWFOUNDLAND 2, 9, 29, 49, 57, 140, 145, 147, 150, 164-65, 217, 219, 221, 246, 248, 293, 301, 317-18, 323; *map* 8, 218, 300
- CLARENVILLE-OBAN LINK *See* North Atlantic Link
- CLARENVILLE-SYDNEY MINES LINK *See* Newfoundland-Nova Scotia Link
- CLIFTON PRECISION PRODUCTS COMPANY 1494, 1499
- CODE(S), CODING
 block, binary 517-35
 error correcting 517-35
 binary, non 1341-88
 geometric concept 1343-44
 non-binary 1341-88
 purpose 1341-43
 Reed-Muller 1341
- Coincidences in Poisson Patterns* (E. N. Gilbert, H. O. Pollak) 1005-33
- Cold Cathode Gas Tubes for Telephone Switching Systems* (M. A. Townsend) 755-68
- COMBINATORIAL ANALYSIS
 error correcting coding 517-35
- COMMUNICATION
 channel, *see* Channel
- CONNECTION, shortest, network 1389-1401
- COMPANDING
 improvement 671, 688-90
 instantaneous
 signals, quantized 653-709
 carrier, P1 357
- COMPANY, TELEPHONE *See* Operating Companies
- CONDUIT
 metal, testing 737-54
 round, strength requirements 737-54

CONDUIT (Cont.)

- underground
 - clay, vitrified 737
 - loads 737
 - metal, testing 737-54
 - round
 - strength requirements 742-54

CONSOL (navigation system) 1050

CONTACT(s)

- relay
 - arcing 769-812
 - erosion, by vapors 769-812

CONTINENTAL SHELF, North Atlantic Ocean 1063-64

Cook, Madeline L. 1126

COOPERATION *See* International Co-operation

COPENHAGEN 9

COPPER TUBING

- repeater, flexible, North Atlantic link 114-15

CORONA

- power supply, transatlantic telephone cable 159

COUPLED-WAVE TRANSDUCER *See* Transducer

COUPLER, waveguide

- attenuation 392
- design 394-401

Crawford, Arthur B.

- biographical material 828
- Reflection Theory for Propagation beyond the Horizon* 627-44

CROSSTALK, transatlantic telephone cable 161, 230, 243

CRYSTAL

- ferrites, *see* Ferrite
- quartz
 - repeater, flexible, North Atlantic link 120-23

CUBA 13

Curtis, Harold E. 889

- biographical material 828
- Interchannel Interference due to Klystron Pulling* 645-52

D

DC *See* Direct Current

Dagnall, C. H. 1449

DATA TRANSMISSION

- AM systems 1451-86
- error correcting codes, non-binary 1341-88
- leased-line services, transmission aspects 1451-86
- mutilation 1342

Dawson, Robert W.

- biographical material 588
- Experimental Dual Polarization Antenna Feed for Three Radio Relay Bands* 391-408

DAYTONA BEACH, FLORIDA, test site 1115-21

DECCA NAVIGATOR 1050

DECODER, error correcting codes, non-binary 1341-88

DeCoste, J. B. 1126

DEFENSE WORK *See* Military Communications

De Hoff, Barbara 448

Depew, C. 768

Design, Performance and Application of the Vernier Resolver (G. Kronacher) 1487-1500

Desoer, Charles A. 156-58

- biographical material 1511
- Network Containing a Periodically Operated Switch Solved by Successive Approximations* 1403-28

Determination of Pressure Coefficients of Capacitance for Certain Geometries (D. W. McCall) 485-95

DIAL TELEPHONE, DIALING

- cable, *see* Cable
- carrier, *see* Carrier
- channels, *see* Channel
- circuit
 - data transmission services 1451-86
 - companies, *see* Operating Companies
 - exchange, *see* Telephone Exchange
 - leased-lines, *see* Leased-Line Services
 - repeaters, *see* Repeater
 - rural, *see* Rural Telephone Service
 - telephone exchange, *see* Telephone Exchange
- traffic, *see* Traffic
- transmission, *see* Transmission
- trunks, *see* Trunk

- DIELECTRIC, inhomogeneous, waveguide, circular, curved 1209-51
 DIELECTRIC-COATED WAVEGUIDE *See* Waveguide
 DIELECTRIC CONSTANT
 capacitance, pressure coefficients 485
 DIGIT, binary *See* Bit
 DIRECT CURRENT
 transatlantic telephone cable 139-62
 DISTORTION
 FM signal, noise modulated 879-89
 TD-2 radio relay system 1429-50
Distortion Produced in a Noise Modulated FM Signal by Non-Linear Attenuation and Phase Shift (S. O. Rice) 879-98
 Doba, S. 889
Dynamics and Kinematics of the Laying and Recovery of Submarine Cable (E. E. Zajac) 1129-1207

E
 E.P.I. (electronic position indicator) 1050
 EARTHQUAKES, ocean bottom 1086-88
 EASTERN TELEPHONE AND TELEGRAPH COMPANY 7, 244
 Ebbe Grace L. 1449
 ECHO, transatlantic telephone cable 21
 ECHO SOUNDING 1051-52, 1055
 EFFICIENCY
 electron tubes, transatlantic telephone cable 3
 ELASTOMER(s)
 BOD test 1099
 marine conditions 1905-1127
 ELECTRIC WAVE *See* Wave
 ELECTRICAL ATTENUATION *See* Attenuation
 ELECTRICAL CAPACITANCE *See* Capacitance
 ELECTRICAL CAPACITOR *See* Capacitor
 ELECTRICAL CONTACTS *See* Contact
 ELECTRICAL DISTORTION *See* Distortion
 ELECTRICAL FILTERS *See* Filter
 ELECTRICAL INDUCTOR *See* Inductor
 ELECTRICAL INTERFERENCE *See* Interference
 ELECTRICAL LOADING *See* Loading
 ELECTRICAL LOSS *See* Net Loss; Transmission Loss
 ELECTRICAL NETWORK *See* Network
 ELECTRICAL NOISE *See* Noise
 ELECTRICAL TRANSFORMER *See* Transformer
Electrically Operated Hydraulic Control Valve (J. W. Schaefer) 711-36
 ELECTRON BEAM
 (in) magnetic field, longitudinal
 noise spectrum 831-78
 growing noise 831-53
 UHF 855-78
 noise, electron beam, relation 832
 Pierce-type, noise 833
 ELECTRON TUBE
 6P10 179-80; *illus* 165
 6P12 180-88
 electrical characteristics 184-86
 lifetime 185-86
 tests 186-88
 175HQ 163-79
 cathode assembly *illus* 169
 electrical characteristics 171-77
 fabrication 177-78
 heater *illus* 169
 mechanical features 168-78
 reliability 178
 selection 177-78
 SP61 179-80
 gas diode
 by-pass 88-90; *illus* 89
 gas discharge
 characteristics 755-65
 switching systems 755-68
 submarine cables, performance requirements 163-88
 traveling-wave, noise 831
 See also Klystron Pulling
Electron Tubes for the Transatlantic Cable System (M. F. Holmes, J. O. McNally, G. H. Metson, E. A. Veazie) 163-88
 ELECTRONIC POSITION INDICATOR 1050
 Elmendorf, C. H.
 biographical material 1317
 Oceanographic Information for Engineering Submarine Cable Systems 1047-93

- Emling, J. W.
 biographical material 339
Transatlantic Telephone Cable System—Planning and Over-All Performance 7-27
- ENCODER, error correcting codes, non-binary 1341-88
- ENGINEERING, traffic 940
- ENGLAND map 294, 296
- EQUALIZER(s)
 repeater, flexible
 North Atlantic link 99-100
 shore
 transatlantic telephone cable 46-49
 transverse
 TD-2 radio relay system 1429-50
- EQUIPMENT MINIATURIZATION *See* Miniaturization
- ERROR CORRECTING CODES *See* Code
- Ewing, Maurice 1093
- Experimental Dual Polarization Antenna Feed for Three Radio Relay Bands* (R. W. Dawson) 391-408
- Experimental Transversal Equalizer for TD-2 Radio Relay System* (B. C. Bellows, Jr., R. S. Graham) 1429-50
- F**
- 4B TRANSISTOR *See* Transistor
- 5B TRANSISTOR *See* Transistor
- FM *See* Frequency Modulation
- FADING, radio transmission 600-01
- Fedukowicz, W. 1093
- Feher, George
 biographical material 588
Sensitivity Considerations in Microwave Paramagnetic Resonance Absorption Techniques 449-84
- FERRITE
 microwave region, dielectric properties, measurement 427-48
 parameters 428-30
- FERRITE LOADED WAVEGUIDE *See* Waveguide
- FERROMAGNETIC MATERIALS *See* Ferrite
- Field, Cyrus 293
- FIELD *See* Magnetic Field
- FILTER(s), carrier, P1 365-66
- Fischer, H. C.
 biographical material 339
Cable Design and Manufacture for the Transatlantic Submarine Cable System 189-216, 496
- Fletcher, R. C. 426, 483, 1337
Fluctuations of Telephone Traffic (V. E. Beneš) 965-73
- FOG, and radio transmission 602
- Foster, H. 1093
- FRANCE map 294, 296
- FRANKFURT, Germany 9
- Fraser, John M.
 biographical material 340
System Design for the North Atlantic Link 29-68
- FREQUENCY, transatlantic telephone cable 18, 24-26
- FREQUENCY MODULATION
 interference, interchannel
 klystron pulling 645-52
- FRESNEL ZONES 597-99
- Friis, Harald T.
 biographical material 828
Reflection Theory for Propagation beyond the Horizon 627-44
- G**
- GAS DIODE TUBE *See* Electron Tube
- GAS DISCHARGE TUBE *See* Electron Tube
- GEIGER COUNTERS, Poisson patterns 1005-33
- GENERALIZED TELEGRAPHIST'S EQUATIONS
 waveguide, circular, curved
 dielectric, inhomogeneous 1209-51
- Gere, E. 483
- Germer, Lester H.
Activation of Electrical Contacts by Organic Vapors 769-812
 biographical material 829
- Geschwind, S. 483
- Gibson, W. C. 1126
- Gilbert, E. N. 964
 biographical material 1045
Coincidences in Poisson Patterns 1005-33
- Gilbert, J. J. 67

- Glaser, J. L. 698
 GLASGOW, Scotland 9
 Gleichmann, T. F.
 biographical material 340
 Repeater Design for the North Atlantic Link 69-101
 Graham, R. Sheils
 biographical material 1511
 Experimental Transversal Equalizer for TD-2 Radio Relay System 1429-50
 Great Eastern (cable ship) 293, 303
 GREENLAND map 8
 Griffith, R. G.
 biographical material 340
 Transatlantic Telephone Cable System—Planning and Over-All Performance 7-27
 Grismore, O. D. 495
 GUIDE See Waveguide
 GUIDED MISSILES See Nike
 Gumley, R. H. 812
 GUN See Electron Gun
 Gupta, S. S. 576
- H**
- H.M.T.S. Monarch* See *Monarch*
 Hagelbarger, D. W. 1033
 Hale, A. L. 1093
 Halsey, R. J.
 biographical material 341
 System Design for the Newfoundland-Nova Scotia Link 217-44
 Transatlantic Telephone Cable System—Planning and Over-All Performance 7-27
 Hamming, R. W. 535
 HAWAIIAN TELEPHONE CABLE 168
 HAWTHORNE WORKS (WESTERN ELECTRIC) 107
 Heezen, Bruce C.
 biographical material 1317
 Oceanographic Information for Engineering Submarine Cable Systems 1047-93
 Heffner, William W.
 biographical material 341
 Repeater Production for the North Atlantic Link 103-38
 Heskett, H. E. 405
 High-Voltage Conductivity-Modulated Silicon Rectifier (M. B. Prince, H. S. Veloric) 975-1004
 HILLSIDE PLANT (WESTERN ELECTRIC) 103-38
 Hipkins, Renee 512
 Hogg, David C.
 biographical material 829
 Reflection Theory for Propagation beyond the Horizon 627-44
 Holdaway, V. L. 768
 Holmes, M. F.
 biographical material 341
 Electron Tubes for the Transatlantic Cable System 163-88
 Hoth, D. F. 698
 Howard, John D.
 biographical material 588
 New Carrier System for Rural Service 349-90
 Huyett, Marilyn J.
 biographical material 589
 Selecting the Best One of Several Binomial Populations 537-76
 HUMAN CHANNEL See Channel
- I**
- ICELAND map 8
 INDUCTOR
 carrier, P1 366-67
 repeater, flexible
 North Atlantic link 127-29
 INFORMATION RATE
 channel, human 497-516
 prose 501-04
 reading rates 497-516
 word length 500
 vocabulary size 409
 vocoder 497
 INFORMATION STORAGE
 twistor 1319-40
 INHOMOGENEOUS DIELECTRIC See Dielectric
 INSPECTION
 repeater, flexible, transatlantic telephone cable 131-38
 INSTALLATION
 carrier, P1 380-90

- Instantaneous Companding of Quantized Signals* (B. Smith) 653-709
- INTEGRITY (components) 31, 33
- Interchannel Interference due to Klystron Pulling* (H. E. Curtis, S. O. Rice) 645-52
- interchannel, frequency modulation klystron pulling 645-52
- power spectrum 647-48
- transatlantic telephone cable power supply 161
- INTERNATIONAL CONSULTATIVE COMMITTEE ON TELEPHONY standards 17
- INTERNATIONAL COOPERATION 7-8, 14-15, 27, 246, 326
- IONOSPHERE, radio transmission 618-23
- IOWA ENGINEERING EXPERIMENT STATION
- conduit, underground 737-54
- IRELAND map 294, 296
- J**
- J-7 TRANSDUCER *See* Transducer: electrohydraulic
- Jack, John S.
- biographical material 341
- Route Selection and Cable Laying for the Transatlantic Cable System* 293-326
- Jacobs, O. B. 67
- Jensen, R. A. 1337
- Jervy, W. T. 754
- JUTE, in BOD test 1099
- K**
- Kankowski, Edward 448
- Kaplan, E. L. 576
- Karlin, John E.
- biographical material 589
- Reading Rates and the Information Rate of a Human Channel* 497-516
- KEARNEY WORKS (W. E. Co.) 103-38
- Kegelman, T. D. 1126
- Kelly, J. L. 512
- Kelly, Mervin J.
- biographical material 342
- Transatlantic Communications—An Historical Resume* 1-5
- Kelly, R.
- biographical material 342
- Power-Feed System for the Newfoundland-Nova Scotia Link* 277-92
- Kelvin, Lord 11, 293
- Kip, A. F. 483
- KLYSTRON PULLING
- interference, interchannel 645-52
- Kohman, G. T. 495
- Kronacher, Gerald
- biographical material 1512
- Design, Performance and Application of the Vernier Resolver* 1487-1500
- L**
- L-TYPE CARRIER *See* Carrier
- LABORATORIES *See* Bell Telephone Laboratories
- Lamb, Harold A.
- biographical material 342
- Repeater Production for the North Atlantic Link* 103-38
- Lawton, C. S. 1126
- LAYING *See* Cable Laying
- Leach, Priscilla 1126
- LEASED-LINE SERVICES
- data transmission
- transmission aspects 1451-86
- network, shortest connection 1389-1401
- Lebert, Andrew W. 495
- biographical material 343
- Cable Design and Manufacture for the Transatlantic Submarine Cable System* 189-216, 496
- Lee, C. Y. 1387
- Leech, W. H.
- biographical material 343
- Route Selection and Cable Laying for the Transatlantic Cable System* 293-326
- Letham, D. L. 512
- Levenbach, G. J. 1004
- Lewis, Herbert A.
- biographical material 343
- Route Selection and Cable Laying for the Transatlantic Cable System* 293-326
- System Design for the North Atlantic Link* 29-68

- Lewis, J. A. 495
- LIFE EXPECTANCY
electron tube
175HQ 166, 171-77
6P12 185-86
transatlantic telephone cable
North Atlantic link 66-67
- LIMNORIA 1096-1127
- Lince, Arthur H.
biographical material 344
Repeater Design for the North Atlantic Link 69-101
- LINEAR PROGRAMMING
binomial processes 537-76
- Lloyd, Stuart P. 964
Binary Block Coding 517-35
biographical material 589
- LOADING
repeaters, submarine cable 20
- LONDON 7-9; *map* 8
- Looney, D. H. 1337
- LORAC (navigation system) 1050
- LORAN (navigation system) 1050
- Loss *See* Net Loss; Transmission Loss
- Lovell, G. H.
biographical material 344
System Design for the North Atlantic Link 29-68
- Lozier, J. C. 1499
- Lutchko, F. R. 1004
- Lutz, Mary 512
- Lynch, A. C. 495
- M**
- McCall, D. W.
biographical material 589
Determination of Pressure Coefficients of Capacitance for Certain Geometries 485-95
- McClure, B. T. 768
- McMillan, B. 698
- McNally, J. O.
biographical material 344
Electron Tubes for the Transatlantic Cable System 163-88
- MAGDALENA RIVER
turbidity currents 1089-90
- MAGNETIC WIRE *See* Wire
- MAINTENANCE
carrier, P1 375
Newfoundland-Nova Scotia link 235-41
North Atlantic link 55-57
transatlantic telephone cable 21-23, 55-57, 235-41
- MARINE BORER(S)
test sites 1115-21
transatlantic telephone cable 194
- MARINE NAVIGATION *See* Navigation
- MARITIME PROVINCES OF CANADA 9
- Measurement of Dielectric and Magnetic Properties of Ferromagnetic Materials at Microwave Frequencies* (W. von Aulock, J. H. Rowen) 427-48
- MEMORY ARRAYS
twistor 1319-40
- Mertz, Pierre
biographical material 1512
Transmission Aspects of Data Transmission Service Using Private Line Voice Telephone Channels 1451-86
- Meszaros, George W.
biographical material 345
Power Feed Equipment for the North Atlantic Link 139-62
- METERING
current, transatlantic telephone cable 151-58
- METHYL-METHACRYLATE *See* Plexiglass
- Metson, G. H.
biographical material 345
Electron Tubes for the Transatlantic Cable System 163-88
- MICA CAPACITORS *See* Capacitor
- Michaels, S. E. 512
- MICROWAVE(S)
feed, polarization, dual 391-408
paramagnetic resonance techniques 449-84
- MICROWAVE RELAY SYSTEMS *See* Radio Relay Systems
- MID-ATLANTIC RIDGE 1066-68
- MILITARY COMMUNICATIONS
Nike, electrohydraulic transducer 711-36
servomechanisms, hydraulic 736
- Miller, S. E. 405

- MINIATURIZATION, carrier, P1 370
- MISALIGNMENT, transatlantic cable,
North Atlantic link 42-46
- Mitchel, Duncan M. 754
- Mitchell, Doren
biographical material 1512
*Transmission Aspects of Data Trans-
mission Service Using Private Line
Voice Telephone Channels* 1451-86
- MODE(s), normal, electric waves, circu-
lar 1292-1307
- MODULATION
amplitude, *see* Amplitude Modulation
frequency, *see* Frequency Modulation
- MODULATION
transatlantic telephone cable
North Atlantic link 63
- pulse
amplitude (PAM) 655-57
code (PCM) 655-57
quantizing impairment 656-57
duration (PDM) 655-57
position (PPM) 655-57
- Monarch* (cable ship) 162, 244, 250,
303-26; *illus* 305
cable gear line schematic 310
- MONOGRAPHS, recent, of Bell System
technical papers not published in
this Journal 335-37, 583-87; 823-27;
1043-44; 1313-17; 1508-10
- Monro, S. 576
- MONTREAL 7-9; map 8
- Morgan, Samuel P.
biographical material 1318
*Theory of Curved Circular Waveguide
Containing an Inhomogeneous Di-
electric* 1209-51
- Mottram, Elliott T.
biographical material 345
*Transatlantic Telephone Cable System—
Planning and Over-All Performance*
7-27
- Murphy, R. B. 576
- MUTILATION (data transmission) 1342
- N**
- No. 4B TRANSISTOR *See* Transistor
- No. 5B TRANSISTOR *See* Transistor
- No. 6P10 ELECTRON TUBE *See* Electron
Tube
- No. 6P12 TUBE *See* Electron Tube
- No. 7F TEST SET *See* Test Set
- No. 175HQ TUBE *See* Electron Tube
- No. SP61 TUBE *See* Electron Tube
- NANTUCKET 13
- NAVIGATION
marine, systems table 1050
- NET LOSS
transatlantic telephone cable 18
- NETWORK
carrier, P1 369
shortest connection 1389-1401
construction principles 1391-94
U. S. state capitals *illus* 1390
switching, periodic 1403-28
*Network Containing a Periodically Oper-
ated Switch Solved by Successive
Approximations* (C. A. Desoer)
1403-28
- New Carrier System for Rural Service* (R.
C. Boyd, J. D. Howard, L. Pedersen)
349-90
- New Storage Element Suitable for Large
Sized Memory Arrays—the Twistor*
(A. H. Bobeck) 1319-40
- NEW YORK CITY map 7-9, 11; 8
- NEWFOUNDLAND map 294, 296, 300
- NEWFOUNDLAND-NOVA SCOTIA LINK
attenuation 221-23
circuits 223
crosstalk 230, 243
design 217-44
electron tubes 163-88, 179-88
maintenance 235-41
noise 229, 241-42
power supply 225-27, 277-92
repeaters 163-88, 245-76
route selection 317-20
terminals 227-29
transmission loss 229, 241
transmission objectives 217
Niagara (cable ship) 303
- NIKE
roll servo
purpose 711
simplified schematic 712
transducer, electrohydraulic, J-7
711-36

NOISE

- electron beam 831-78
- electron tube, traveling-wave 831
- error correction codes 1341-88
- Newfoundland-Nova Scotia Link 229, 241-42
- transatlantic telephone cable
 - North Atlantic link 39-42, 62-63
 - radio transmission 623-25
- Noise Spectrum of Electron Beam in Longitudinal Magnetic Field: The Growing Noise Phenomenon; The UHF Noise Spectrum* (W. W. Rigrod) 831-78
- Non-Binary Error Correction Codes* (W. Ulrich) 1341-88
- NONLINEAR ATTENUATION *See* Attenuation
- Normal Mode Bends for Circular Electric Waves* (H. G. Unger) 1292-1307
- NORTH AMERICA *map* 294, 296
- NORTH ATLANTIC LINK
 - bandwidth 34-35
 - cable current
 - regulation 143-45; *simplified schematic* 143-45
 - channels 38
 - description 29-31
 - design 29-68
 - electron tubes 163-78
 - equalization
 - shore 46-49; *block schematics*
 - inaccessibility 34
 - integrity 33
 - maintenance 55-57
 - misalignment 42-46
 - modulation 63
 - noise 39-42, 62-63
 - performance 59-65
 - power feed, *see* Power Supply
 - repeaters, *see* Repeater
 - schematic diagram* 30
 - signal-to-noise design 35
 - spares 65-66
 - terminals 52-55
 - testing 55-59
- NORTH ATLANTIC OCEAN
 - basins 1064-65
 - bottom 1072-74

- temperature 1077-86
- continental shelf 1063-64
- earthquake epicenters *map* 1087
- telegraph cables *map* 294
- topography 1061-70; *illus*
- NORTH SEA 3
- NORTHERN ELECTRIC COMPANY, LTD. 57, 244
- Norton, E. L. 736
- NOVA SCOTIA *map* 294, 296
- Noyce, R. N. 1004
- NUMBER 4B TRANSISTOR *See* Transistor
- NUMBER 5B TRANSISTOR *See* Transistor
- NUMBER 6P10 ELECTRON GUBE *See* Electron Tube
- NUMBER 6P12 TUBE *See* Electron Tube
- NUMBER 7F TEST SET *See* Test Set
- NUMBER 175HQ TUBE *See* Electron Tube
- NUMBER SP61 TUBE *See* Electron Tube

O

- 175HQ TUBE *See* Electron Tube
- OBAN, SCOTLAND 2, 9, 29, 49, 57, 140, 145, 147, 150, 164-65, 217, 219, 221, 246, 248, 293, 301, 317-18, 323; *map* 8, 218, 300
- OCEAN BOTTOM
 - catastrophic changes 1086-93
 - knowledge, present 1070-74
 - sediment 1071
 - study 1048
 - evaluation 1056-1057
 - methods 1065-70; *illus*
 - presentation 1057-61
 - topography 1049-65
 - turbidity currents 1089-93
- OCEAN CABLE *See* Submarine Cable
- Oceanographic Information for Engineering Submarine Cable Systems* (C. H. Elmendorf, B. C. Heezen) 1047-93
- OCEANOGRAPHY, defined 1047-48
- OFFICE *See* Central office
- O'Neil, H. T. 1033
- OPERATING COMPANIES
 - carrier, P1 350
- ORDNANCE SURVEY OF GREAT BRITAIN 244

P

- P1 CARRIER *See* Carrier
- PAM *See* Modulation: pulse; amplitude
- PCM *See* Modulation: pulse; code
- PDM *See* Modulation: pulse; duration
- PPM *See* Modulation: pulse; position
- PARALLEL PLATE CAPACITORS *See* Capacitor
- PARAMAGNETIC RESONANCE
absorption 450
- PARAMETER(s)
carrier, P1 351-65
ferrites 428-30
- PARIS 9
- Pauer, J. J. 754
- Pedersen, Ludwig
biographical material 589
New Carrier System for Rural Service 349-90
- PERIODIC SWITCHING *See* Switching
- Perkins, E. H. 390
- PHASE SHIFT
FM signal, noise modulated distortion 879-89
- PHOLADIDAE 1096-1127
- Pierce, John R.
biographical material 590
Reading Rates and the Information Rate of a Human Channel 497-516
- PIERCE-TYPE ELECTRON GUN *See* Electron Gun
- PLASTICS
marine conditions 1095-1127
- PLEXIGLASS
properties 115
repeaters, flexible, North Atlantic link 115-16
- POISSON PATTERNS, coincidences 1005-33
- Pollak, H. O.
biographical material 1045
Coincidences in Poisson Patterns 1005-33
- POLYETHYLENE
BOD test 1099
submarine cable 189-93, 197, 199, 205
- POLYVINYL CHLORIDE, BOD test 1099
- POPULATIONS, binomial *See* Binomial Processes
- Portis, A. M. 483
- PORTLAND, MAINE map 8
- POST OFFICE *See* British Post Office
- POWER, dc, reliability 140
- POWER-FEED *See* Power Supply
- Power Feed Equipment for the North Atlantic Link* (G. W. Meszaros, H. H. Spencer) 139-62
- Power-Feed System for the Newfoundland-Nova Scotia Link* (R. Kelly, J. F. P. Thomas) 277-92
- POWER SUPPLY
carrier, P1 376-80
Newfoundland-Nova Scotia link 225-27, 277, 292
transatlantic telephone cable crosstalk 161
North Atlantic link 49-52, 139-62; schematic diagram 51
equipment design 158-62
standby sources 145-51
- Prim, R. C.
biographical material 1512
Shortest Connection Networks and Some Generalizations 1389-1401
- Prince, M. B.
biographical material 1045
High-Voltage Conductivity-Modulated Silicon Rectifier 975-1004
- PRINTED CIRCUITRY
carrier, P1 371
- PRIVATE LINE SERVICES *See* Leased-Line Services
- PROBABILITIES, binomial processes 537-76
- PROCESSES *See* Binomial Processes
- PROGRAMMING *See* Linear Programming
- PROPAGATION *See* Transmission
- PROSE, information rate 501-04
- PULSE MODULATION, quantized 655-57

Q

- QUALITY
Bell System 103
Western Electric 103
- QUANTIZED SIGNAL *See* Signal
- QUARTZ CRYSTAL *See* Crystal
- QUEBEC (city) map 8

R

- Radio Propagation Fundamentals* (K. Bullington) 593-626
- RADIO RELAY SYSTEMS
- TD-2
- distortion 1429-50
 - equalizer, transversal 1429-50
 - repeaters, equalizer, transversal 1429-50
- RADIO TELEPHONE, transatlantic 5
- RADIO TRANSMISSION LOSS *See* Transmission Loss
- RAIN, and radio transmission 602
- Radley, Sir Gordon
- biographical material 345
 - Transatlantic Communications—An Historical Resume* 1-5
- RAYLEIGH DISTRIBUTION 600-01, 624
- Reading Rates and the Information Rate of a Human Channel* (J. E. Karlin, J. R. Pierce) 497-516
- RECTANGULAR WAVEGUIDE *See* Waveguide
- RECTIFIER
- silicon, conductivity-modulated high-voltage 975-1004
 - solid state
 - voltage 975
- REED-MULLER CODES 1341
- Reflection Theory for Propagation beyond the Horizon* (A. B. Crawford, H. T. Friis, D. C. Hogg) 627-44
- REGENERATIVE REPEATER *See* Repeater
- REGULATOR
- current, transatlantic telephone cable 143-45
- RELAY SYSTEMS *See* Radio Relay Systems
- RELIABILITY
- electron tube, 175HQ 178
- REPEATER
- carrier, P1 362-65, 373-75
 - flexible
 - North Atlantic link 69-138
 - capacitors 125-26
 - circuit 71
 - components 81-88
 - container 90-94
 - coupling networks 73-76
 - design 69-101
 - equalization 99-100
 - feedback loop 78-79
 - gain formula 72-73
 - gas diode tube 88-90; *illus* 89
 - inspection 131-38
 - manufacture 103-38
 - assembly 116-20
 - brazing 116-20
 - clothing, special 109
 - dust count 110
 - quartz crystals 120-23
 - mechanical design 79-81
 - packing 130
 - performance 96-98
 - power feed 139-62
 - production 110-14
 - raw materials 114-16
 - schematic diagram 70
 - seals 90-94, 123-25; *illus* 118
 - shipping 130
 - subcontracted operations 107-08
 - testing 77-78, 94-96
 - Newfoundland-Nova Scotia link 245-76
 - regenerative, self-timing 891-937
 - reliability 245
 - submarine cable
 - British Post Office 12
 - loading 20
 - TD-2 radio relay system
 - equalizer, transversal 1429-50
 - transatlantic telephone cable
 - armoring 58
 - efficiency 2-3
 - electron tubes 2-4
 - specifications 2
 - Repeater Design for the Newfoundland-Nova Scotia Link* (R. A. Brockbank, D. C. Walker, V. G. Welsby) 245-76
 - Repeater Design for the North Atlantic Link* (F. J. Braga, T. F. Gleichmann, A. H. Lince, M. C. Wooley) 69-101
 - Repeater Production for the North Atlantic Link* (W. W. Heffner, H. A. Lamb) 103-38
- RESIN(s)
- casting 1095-1127
 - BOD test 1099
 - marine conditions 1095-1127

- Resistance of Organic Materials and Cable Structures to Marine Biological Attack* (L. R. Snoke) 1095-1127
- RESISTOR**
 repeater, flexible
 North Atlantic link 126-27
- RESOLVER** *See* Synchro Resolver; Vernier Resolver
- RESONANCE** 450
See also Paramagnetic Resonance
- Rice, Stephen O. 698
 biographical material 829, 1046
Distortion Produced in a Noise Modulated FM Signal by Non-Linear Attenuation and Phase Shift 879-89
Interchannel Interference due to Klystron Pulling 645-52
- Richards, A. P. 1126
- Rigrod, W. W.
 biographical material 1046
Noise Spectrum of Electron Beam in Longitudinal Magnetic Field: The Growing Noise Phenomenon; The UHF Noise Spectrum 831-78
- Riordan, J. 964-65
- RINGING**
 carrier, P1 359-61
- Rose, A. C. 1387
- ROUND WAVEGUIDE** *See* Waveguide: circular
- Route Selection and Cable Laying for the Transatlantic Cable System* (J. S. Jack, W. H. Leech, H. A. Lewis) 293-326
- Rowen, John H.
 biographical material 590
Measurement of Dielectric and Magnetic Properties of Ferromagnetic Materials at Microwave Frequencies 427-48
- RURAL TELEPHONE SERVICE**
 carrier, P1 349-90
- S**
- 6P10 ELECTRON TUBE *See* Electron Tube
- 6P12 ELECTRON TUBE *See* Electron Tube
- 6P12 TUBE *See* Electron Tube
- 7F TEST SET *See* Test Set
- SP61 TUBE *See* Electron Tube
- Schaefer, J. W.
 biographical material 830
Electrically Operated Hydraulic Control Valve 711-36
- SCOTLAND map 294, 296
- SEA *See* Ocean Bottom
- SEAL(s), repeater, flexible, North Atlantic link 90-94, 123-25; *illus* 118
- SEASONS, transmission, radio, beyond the horizon 640-43
- SEDIMENT, ocean bottom 1071
- Seidel, Harold
 biographical material 590
Character of Waveguide Modes in Gyromagnetic Media 409-26
Selecting the Best One of Several Binomial Populations (Marilyn J. Huyett, M. Sobel) 537-76
Self-Timing Regenerative Repeaters (E. D. Sunde) 891-937
- SEMICONDUCTOR(s), SEMICONDUCTING MATERIALS *See* Ferrite
- Sensitivity Considerations in Microwave Paramagnetic Resonance Absorption Techniques* (G. Feher) 449-84
- SERPENTINE WAVEGUIDE *See* Waveguide: circular
- SERVICE *See* Maintenance
- SERVO SYSTEMS
 electrohydraulic, Nike 711-36
 hydraulic, military communications 736
 power supply, transatlantic telephone cable 155-58
 vernier resolver *illus* 1497
- SHORAN (navigation system) 1050
- SHORT CIRCUIT
 cables, Poisson patterns 1005-33
Shortest Connection Networks and Some Generalizations (R. C. Prim) 1389-1401
- SIGNAL(s), SIGNALING
 binary, data transmission 1451-86
 carrier, P1 359
 companding, instantaneous 653-709
 FM, noise modulated distortion 879-89
 quantized, companding, error 665-76
 instantaneous 653-709
 spectrum 663
 transatlantic telephone cable 20-21

- SIMPLEX WIRE AND CABLE COMPANY 196-97
- Silsbee, R. H. 483
- Silverman, S. J. 1004
- Simonick, V. F. 736
- Slepian D. 512
- Slichter, C. P. 483
- Smith, Bernard
biographical material 830
Instantaneous Companding of Quantized Signals 653-709
- Smith, D. H. 390
- Smith, James L.
Activation of Electrical Contacts by Organic Vapors 769-812
biographical material 830
- Snoke, Lloyd R.
biographical material 1318
Resistance of Organic Materials and Cable Structures to Marine Biological Attack 1095-1127
- SNOW and radio transmission 602
- Sobel, Milton
biographical material 590
Selecting the Best One of Several Binomial Populations 537-76
- SO FAR (navigtion system) 1050
- SOLENOID electrohydraulic, J-7 711-36
- SOUNDING, echo 1051-52, 1055
- SOUTHERN UNITED TELEPHONE CO., LTD. 244
- SPARE PARTS, North Atlantic link 65-66
- Spencer, H. H.
biographical material 346
Power Feed Equipment for the North Atlantic Link 139-62
- SPRUCE LAKE, NEW BRUNSWICK 11
- ST. JOHN, NEW BRUNSWICK map 8
- STANDARD TELEPHONES AND CABLES, LTD. 244, 274, 292
- STATES (UNITED STATES), capitals, network, shortest connection 1389-1401; *illus* 1390
- STATISTICAL METHODS
telephone exchange model 939-64
traffic fluctuations 965-73
- STORAGE BATTERY, as power source 140
- STORAGE See Information Storage
- Strength Requirements for Round Conduit* (G. F. Weissmann) 737-54
- SUBMARINE CABLE(S)
background experience 11-15
British Post Office systems 12-13
capacitance 485
electron tubes 3
marine organism attack 1095-1127
North Atlantic link 33
oceanographic information 1047-93
recovery
dynamics 1129-1207
kinematics 1129-1207
research 5
stresses 1
transatlantic telephone, *see* Transatlantic Telephone Cable
transistors 3-4
United States 13-14
- SUBMARINE CABLES, LTD. 196-97, 274
- Sufficient Set of Statistics for a Telephone Exchange Model* (V. E. Beneš) 939-64
- Sunde, Erling D. 889
biographical material 1046
Self-Timing Regenerative Repeaters 891-937
- SWITCHING periodic, network 1403-28
- SWITCHING SYSTEMS
electron tubes, gas discharge 755-68
- SWITCHING TIME twistor 1328
- SYNCHRO RESOLVER
accuracy 1487-88
See also Vernier Resolver
- SYDNEY MINES, NOVA SCOTIA 11, 29, 164-65, 219, 221, 232, 246, 248, 318, 321, 323; map 8, 218, 300
- System Design for the Newfoundland-Nova Scotia Link* (J. F. Bampton, R. J. Halsey) 217-44
- System Design for the North Atlantic Link* (J. M. Fraser, H. A. Lewis, G. H. Lovell, R. S. Tucker) 29-68
- T
- TD-2 RADIO RELAY SYSTEM *See* Radio Relay Systems
- TACAN (navigation system) 1050
- TECHNICAL PAPERS, Bell System, not published in this Journal 327-34, 577-82, 813-22, 1035-42, 1308-13, 1501-07

TELEGRAPH

- North Atlantic routes *map* 294
- transatlantic cable 2, 20, 26-27

TELEGRAPH CONSTRUCTION AND MAINTENANCE Co., LTD. 308

TELEGRAPHIST'S EQUATIONS *See* Generalized Telegraphist's Equations

TELEPHONE EXCHANGE

- model, statistics 939-64

TEMPERATURE

- North Atlantic Ocean 1077-86
- ocean bottom 1075-86

TERMINAL(S)

- carrier, P1 354, 373-75
- network, shortest connection 1389-1401
- Newfoundland-Nova Scotia link 227-29

- transatlantic telephone cable
- North Atlantic link 52-55

TERRENCEVILLE, NEWFOUNDLAND 11, 219, 232, 246, 248, 293, 295, 318-19, 322, 324; *map* 218, 300

TEST(S), TESTING

- biochemical oxygen demand 1098-1114
- carrier, P1 375
- electron tube, 6P12 186-88
- conduit, thin-walled 737-54
- repeater, flexible
- North Atlantic link 77-78, 94-96

TEST SET

- 7F 389-90; *illus* 390
- conduit, thin-walled *illus* 739

Tharp, Marie 1093

Theory of Curved Circular Waveguide Containing an Inhomogeneous Dielectric (S. P. Morgan) 1209-51

Thomas, J. F. P.

- biographical material 346
- Power-Feed System for the Newfoundland-Nova Scotia Link* 277-92

TIME OF DAY, and radio transmission noise 624

Title, R. S. 1337

TONAWANDA PLANT (W. E. Co.) 107

Townsend, Mark A. 88-90

- biographical material 830
- Cold Cathode Gas Tubes for Telephone Switching Systems* 755-68

TRAFFIC

- demand 941
- engineering 940
- fluctuations 965-73
- measurement 939-64

Transatlantic Communications—An Historical Resume (M. J. Kelly, Sir G. Radley) 1-5

TRANSATLANTIC RADIO TELEPHONE 5

TRANSATLANTIC TELEPHONE CABLE

- cable, *see* Submarine Cable
- crosstalk 19-20
- echo 21
- facilities *block diagram* 10
- frequency characteristics 18, 24-26
- maintenance 21-23, 55-57, 235-41
- map* 8, 302
- net loss 18
- noise 19-20
- operating services 21-23
- performance 24-27
- profile* 304
- repeaters, *see* Repeater
- route selection 293-326
- service objectives 16
- signaling objectives 20-21
- submarine cable, *see* Submarine Cable
- system planning 15-24
- telegraph facilities 2, 20, 26-27
- telephone circuits 9
- temperature profile* 1083
- transmission objectives 16-18

Transatlantic Telephone Cable System—Planning and Over-All Performance (J. W. Emling, R. G. Griffith, R. J. Halsey, E. T. Mottram) 7-27

TRANSDUCER

- coupled-wave, problems 391
- electrohydraulic, J-7 711-36
- illus* 717, 718
- actuating mechanism 719-24
- cutaway section* 716
- description 715-19
- exploded view* 717
- hydraulic characteristics 724-34
- internal view* 720
- ports *illus* 714

See also Vernier Resolver

TRANSFORMER, carrier, P1 368-69

TRANSISTOR

- 4B, carrier, P1 355-56
- 4C, carrier, P1 355-56
- carrier, P1 349-90
- submarine cable prospects 3-4
- twistor memory arrays 1333-36

TRANSMISSION

- carrier, P1 351-55
- information, *see* Information Rate
- radio

- beyond the horizon
 - antenna size 639-40
 - experimental data 608-11
 - reflection theory 627-44
 - seasons 640-43

buildings 613-14

fog 602

fundamentals 593-626

ground wave 614-18

ionospheric 618-23

noise levels 623-24

rain 602

snow 602

trees 613-14

transatlantic telephone cable 16-18

Transmission Aspects of Data Transmission Service Using Private Line Voice Telephone Channels (P. Mertz, D. Mitchell) 1451-86

TRANSMISSION LOSS

Newfoundland-Nova Scotia Link 229, 241

radio 593-97

earth, plane *diagrams* 598

line of sight 596-602

TRANSOCEANIC CABLE *See* Submarine Cable

TRANSVERSE EQUALIZER *See* Equalizer

TRAVELING-WAVE TUBE *See* Electron Tube

TREES, and radio transmission 613-14

Tretola, A.R. 1004

TRUNK(S), TRUNKING

carriers 350

defined 941-42

TUBE *See* Electron Tube

TUBING *See* Copper Tubing

Tucker, Rexford S.

biographical material 346

System Design for the North Atlantic Link 29-68

Tukey, J. W. 576, 964

TURBIDITY CURRENTS 1089-93

TWISTOR 1319-40

bits (binary digits) 1336

switching time 1328

transistor powering 1333-36

U

USAF *See* United States Air Force

Ulrich, Werner

biographical material 1513

Non-Binary Error Correction Codes 1341-88

Unger, Hans-Georg

biographical material 1318

Circular Electric Wave Transmission in a Dielectric-Coated Waveguide 1253-78

Circular Electric Wave Transmission through Serpentine Bends 1279-92

Normal Mode Bends for Circular Electric Waves 1292-1307

UNITED STATES

submarine cable systems 13-14

UNITED STATES AIR FORCE MISSILE TEST CENTER, submarine cable 190-92, 214

V

Van Uitert, L. G. 448

VAPOR, organic, contacts, electrical

activation 769-812

erosion 769-812

Vasko, T. J. 1004

Veazie, Edmund A.

biographical material 347

Electron Tubes for the Transatlantic Cable System 163-88

Velorie, Harold S.

biographical material 1046

High-Voltage Conductivity-Modulated Silicon Rectifier 975-1004

VERNIER RESOLVER

applications 1487-1500

design 1487-1500

output 1489

performance 1487-1500

VERNIER RESOLVER (*Cont.*)
 rotor lamination *illus* 1492
 schematic diagram 1490
 servo system *illus* 1497
 stator lamination *illus* 1491

VOCABULARY SIZE
 information rate 499
 VOCODER channel capacity 497
 VOLTAGE rectifier, solid state 975
 Volz, A. H. 1449

W

Wakai, T. W. 1499
 Walker, D. C.
 biographical material 347
 Repeater Design for the Newfoundland-Nova Scotia Link 245-76
 WAR WORK *See* Military Commun.
 Watling, R. G. 754
 WASHINGTON, D. C.
 state capitals, shortest connection network 1389-1401; *illus* 1390
 WAVE
 circular
 bends, serpentine
 transmission 1279-92
 modes, normal, bends 1292-1307
 waveguide, dielectric-coated
 transmission 1253-78
 radio, path 600
 See also Microwave
 WAVEGUIDE
 circular
 bends, modes, normal 1292-1307
 birefringence, effect 409-26
 curved, dielectric, inhomogeneous 1209-51
 modes, in gyromagnetic media 409-26
 propagation characteristics 409-26
 serpentine
 wave, circular, transmission 1279-92
 coupler, *see* Coupler
 coupling
 attenuation 392
 coupler, *see* Coupler
 dielectric-coated, wave, circular, transmission 1253-78

Printed in U. S. A.

ferrite loaded, propagation characteristics 409
 rectangular
 birefringence, effect 409-26
 modes, in gyromagnetic media 409-26
 propagation characteristics 409-26
 round, *see* Waveguide: circular
 Weatherington, C. A. 495
 Weissmann, Gerd F.
 biographical material 830
 Strength Requirements for Round Conduit 737-54
 Welber, I. 1449
 Welsby, V. G.
 biographical material 347
 Repeater Design for the Newfoundland-Nova Scotia Link 245-76
 Wenny, D. H., Jr. 1337
 Werner, J. K. 1449
 WEST HAVEN, CONNECTICUT *map* 8
 White, A. D. 768
 WHITE PLAINS, NEW YORK *map* 8
 Williams, I. V. 754
 Winnicky, A. P. 512
 WIRE(S)
 magnetic, twistor 1319-40
 WIRING, printed, *see* Printed Circuitry
 Wittenberg, A. M. 768
 Wooley, M. C.
 biographical material 347
 Repeater Design for the North Atlantic Link 69-101
 WORDS
 familiarity, and information rate 500
 length, information rate 500
 WRIGHT AIR DEVELOPMENT CENTER 1487, 1499
 WRIGHTSVILLE BEACH, NORTH CAROLINA, test site 1115-21
 Z

Zadeh, L. A. 1387
 Zajac, E. E.
 biographical material 1318
 Dynamics and Kinematics of the Laying and Recovery of Submarine Cable 1129-1207
 ZoBell, Claude E. 1126

THE BELL SYSTEM

Technical Journal

DEVOTED TO THE SCIENTIFIC AND ENGINEERING
ASPECTS OF ELECTRICAL COMMUNICATION

VOLUME XXXVI

JANUARY 1957

NUMBER 1

Transatlantic Communications — An Historical Resume	
MERVIN J. KELLY AND SIR GORDON RADLEY	1
Transatlantic Telephone Cable System—Planning and Over-All Performance	
E. T. MOTTRAM, R. J. HALSEY, J. W. EMLING AND R. G. GRIFFITH	7
System Design for the North Atlantic Link	
H. A. LEWIS, R. S. TUCKER, G. H. LOVELL AND J. M. FRASER	29
Repeater Design for the North Atlantic Link	
T. F. GLEICHMANN, A. H. LINCE, M. C. WOOLEY AND F. J. BRAGA	69
Repeater Production for the North Atlantic Link	
H. A. LAMB AND W. W. HEFFNER	103
Power Feed Equipment for the North Atlantic Link	
G. W. MESZAROS AND H. H. SPENCER	139
Electron Tubes for the Transatlantic Cable System	
J. O. McNALLY, G. H. METSON, E. A. VEAZIE AND M. F. HOLMES	163
Cable Design and Manufacture for the Transatlantic Submarine Cable System	
A. W. LEBERT, H. B. FISCHER AND M. C. BISKEBORN	189
System Design for the Newfoundland-Nova Scotia Link	
R. J. HALSEY AND J. F. BAMPTON	217
Repeater Design for the Newfoundland-Nova Scotia Link	
R. A. BROCKBANK, D. C. WALKER AND V. G. WELSBY	245
Power-Feed System for the Newfoundland-Nova Scotia Link	
J. F. P. THOMAS AND R. KELLY	277
Route Selection and Cable Laying for the Transatlantic Cable System	
J. S. JACK, CAPT. W. H. LEECH AND H. A. LEWIS	293
Bell System Technical Papers Not Published in This Journal	327
Recent Bell System Monographs	335
Contributors to This Issue	338